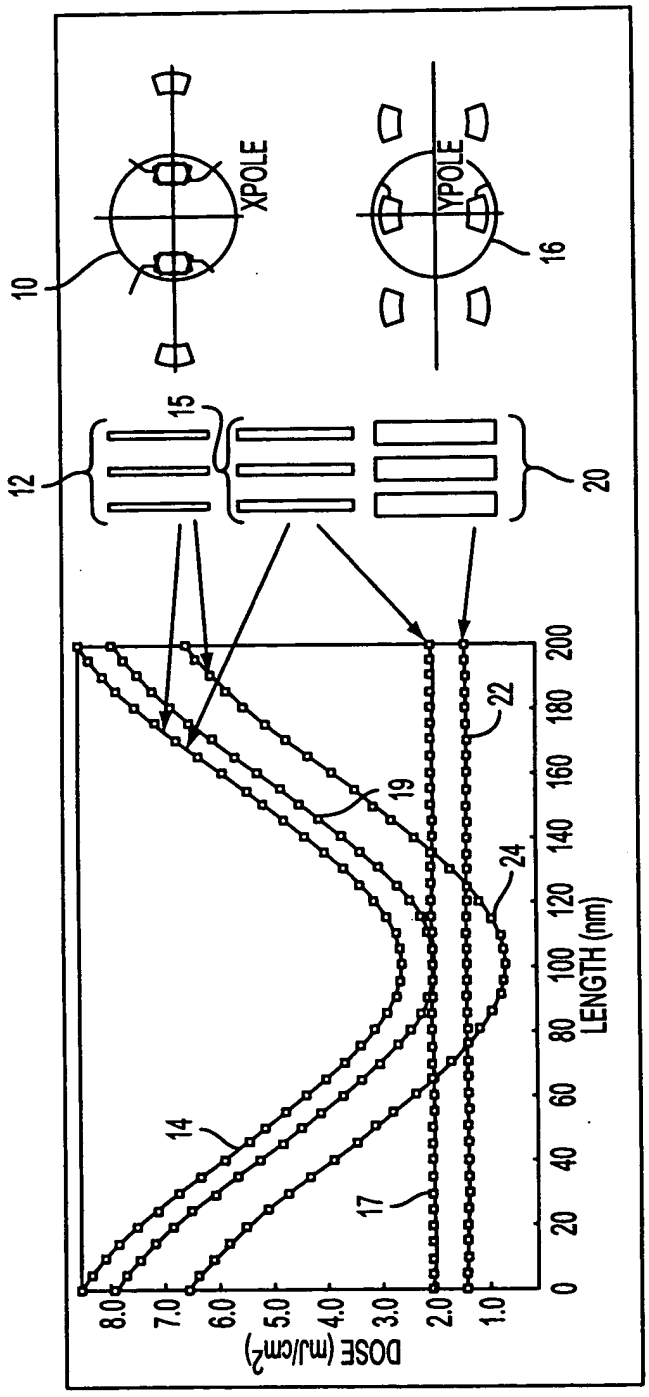
XPOLE
YPOLE
10
12
15
16
20
22
24
19
14
17
DOSE (mJ/cm²)
8.0
7.0
6.0
5.0
4.0
3.0
2.0
1.0
0
20
40
60
80
100
120
140
160
180
200
LENGTH (nm)

FIG. 1

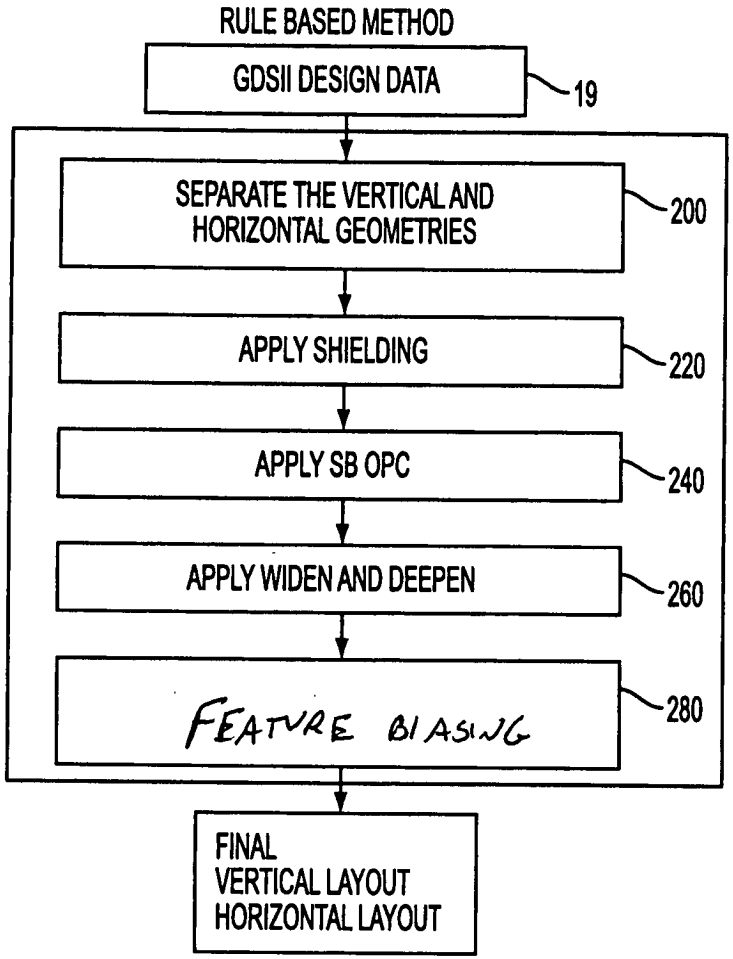
RULE BASED METHOD
GDSII DESIGN DATA
19
SEPARATE THE VERTICAL AND HORIZONTAL GEOMETRIES
200
APPLY SHIELDING
220
APPLY SB OPC
240
APPLY WIDEN AND DEEPEN
260
FEATURE BIASING
280
FINAL
VERTICAL LAYOUT
HORIZONTAL LAYOUT

FIG. 2

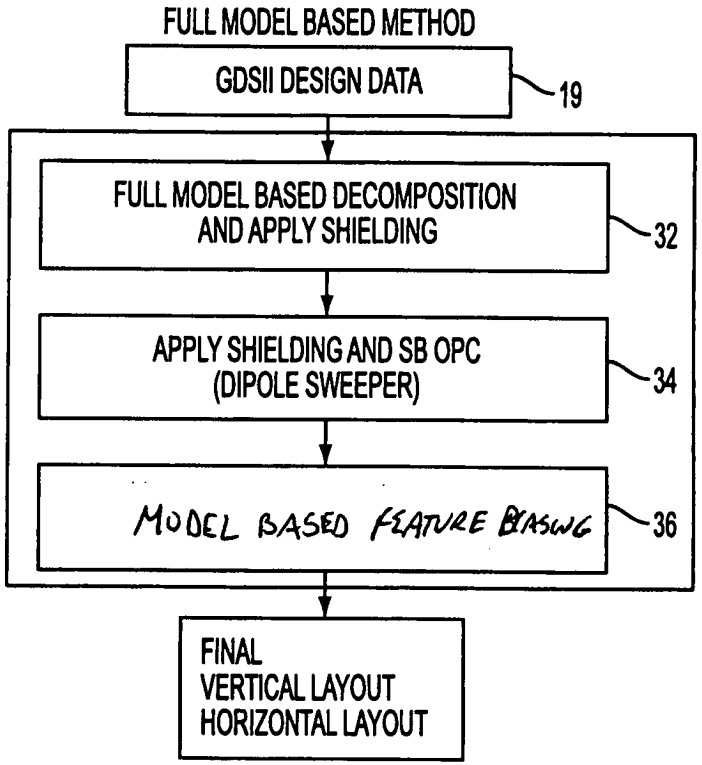
FULL MODEL BASED METHOD
GDSII DESIGN DATA
19
FULL MODEL BASED DECOMPOSITION AND APPLY SHIELDING
32
APPLY SHIELDING AND SB OPC (DIPOLE SWEEPER)
34
MODEL BASED FEATURE BIASING
36
FINAL
VERTICAL LAYOUT
HORIZONTAL LAYOUT

FIG. 3

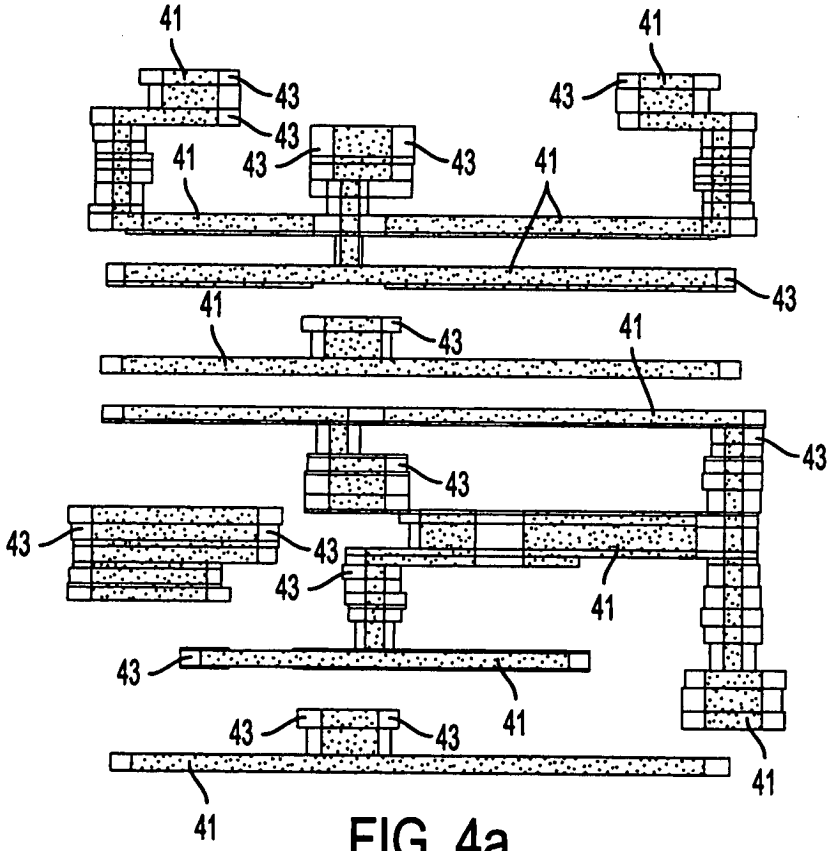

FIG. 4a

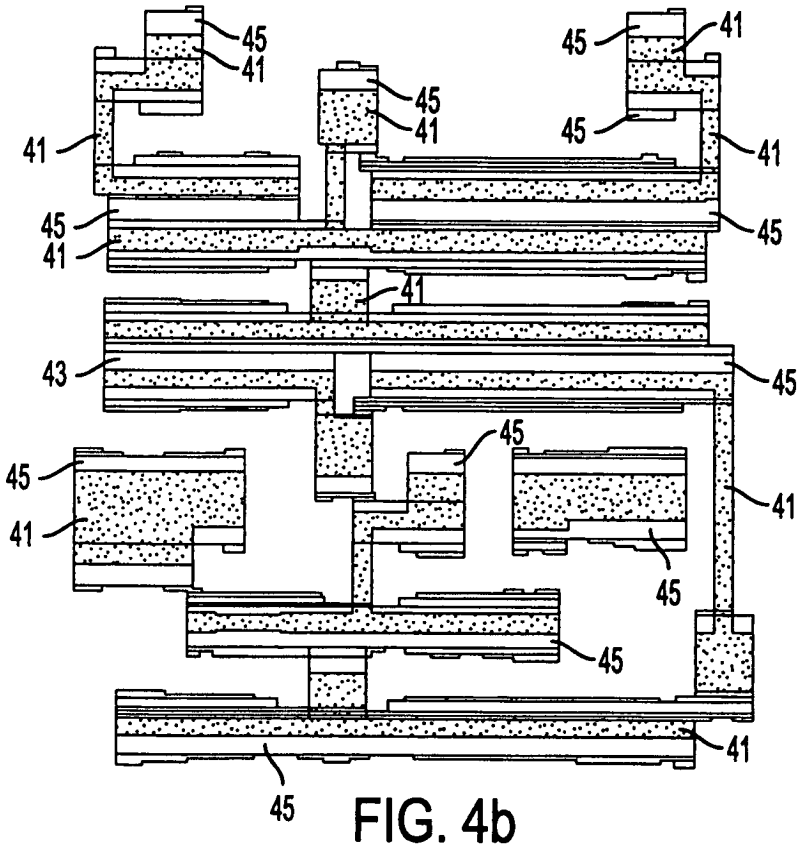

FIG. 4b

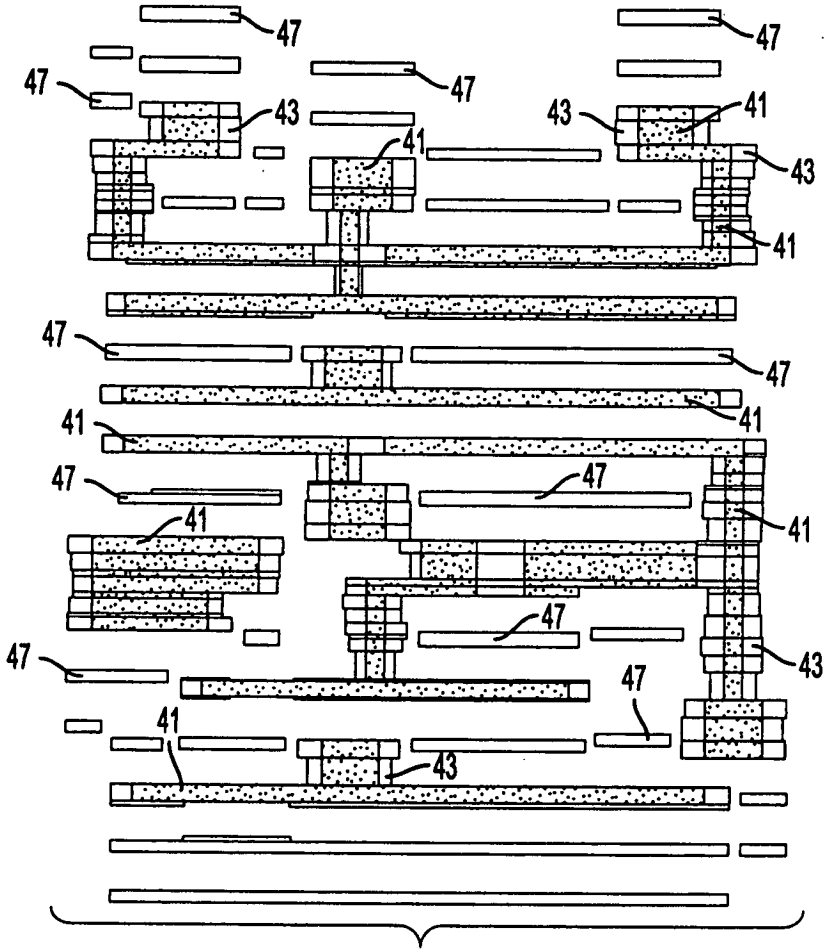
47
47
47
47
43
43
41
41
43
47
47
41
41
47
47
41
47
41
43
47
47
41
43

FIG. 4c

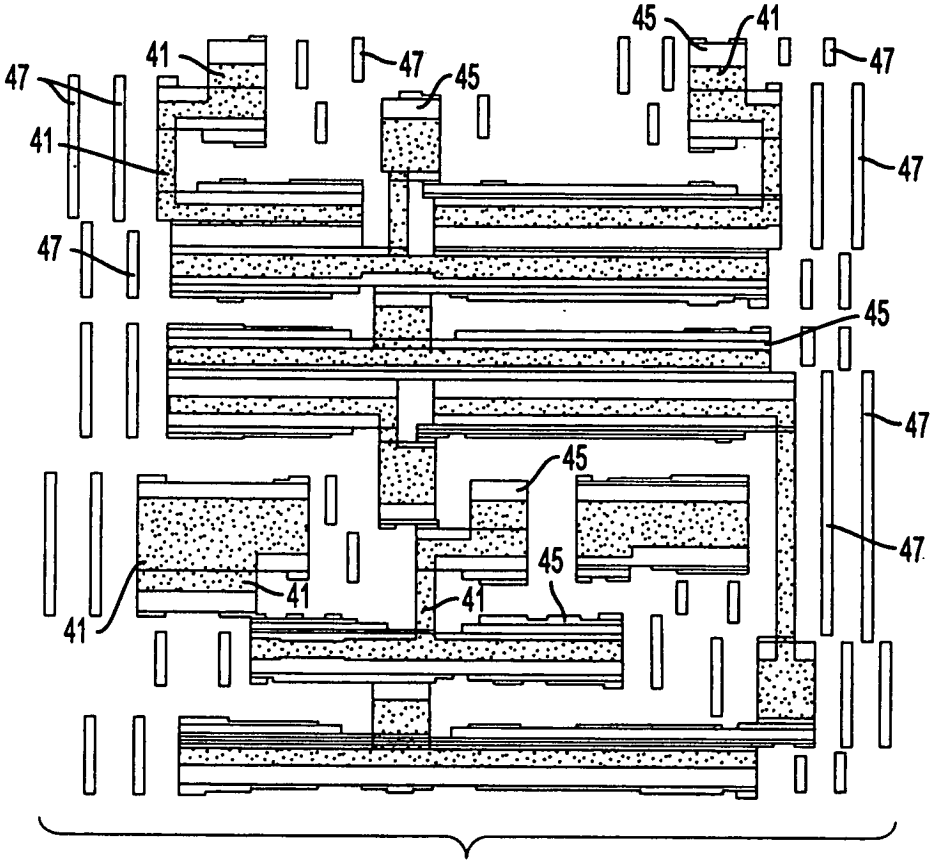
45
41
47
41
47
45
47
47
45
47
45
47
41
41
45
41
47

FIG. 4d

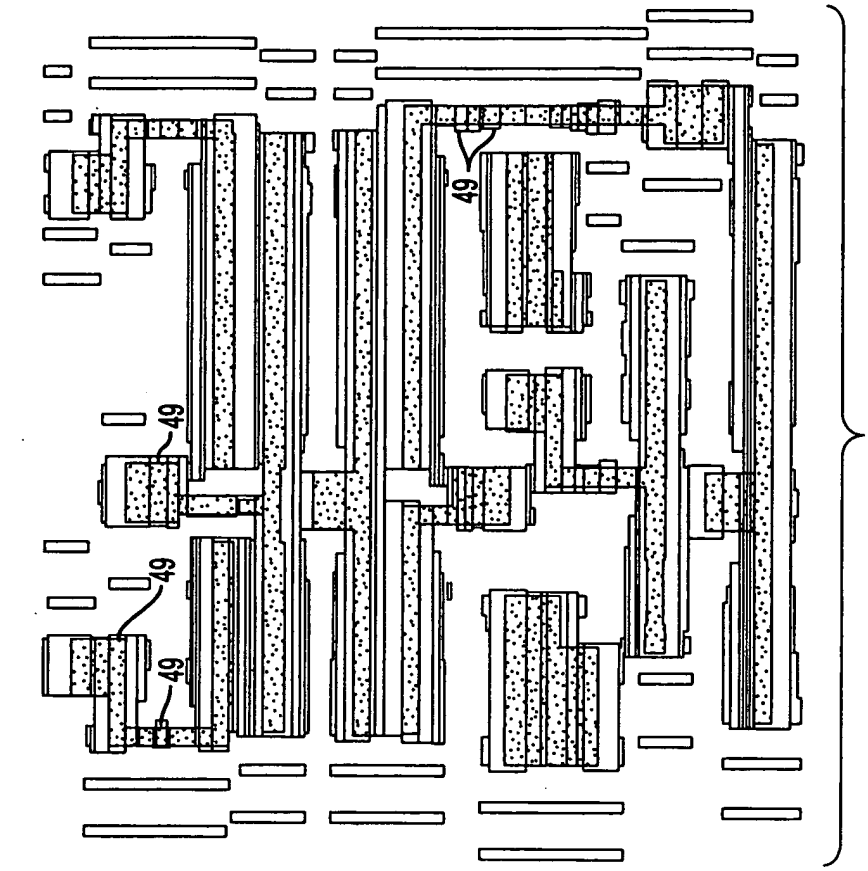

FIG. 4f

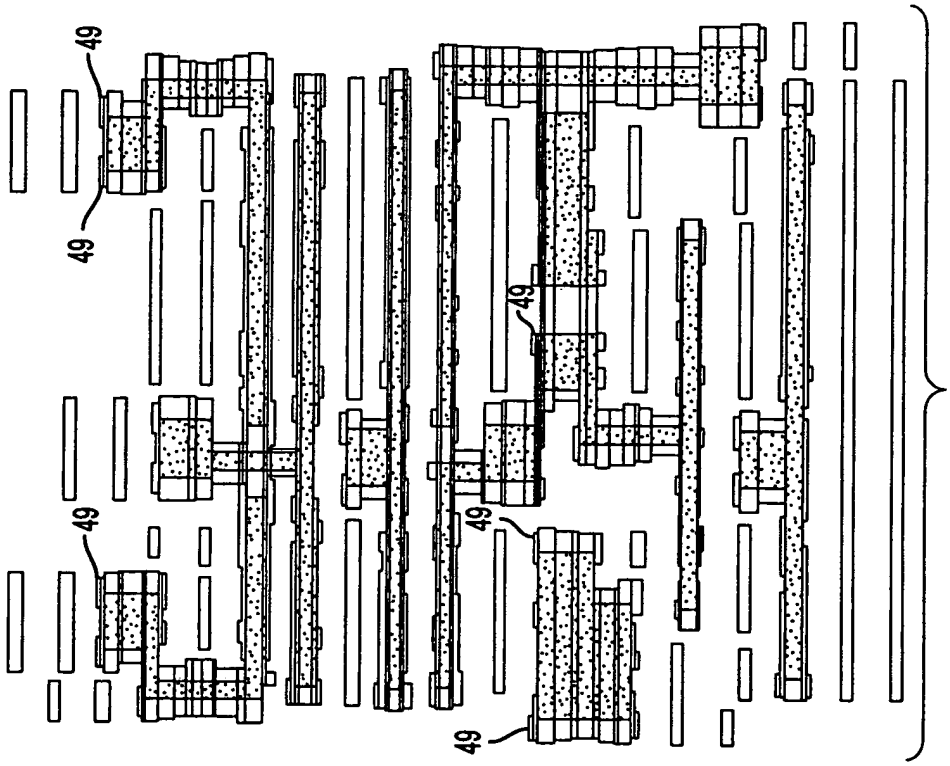

FIG. 4e

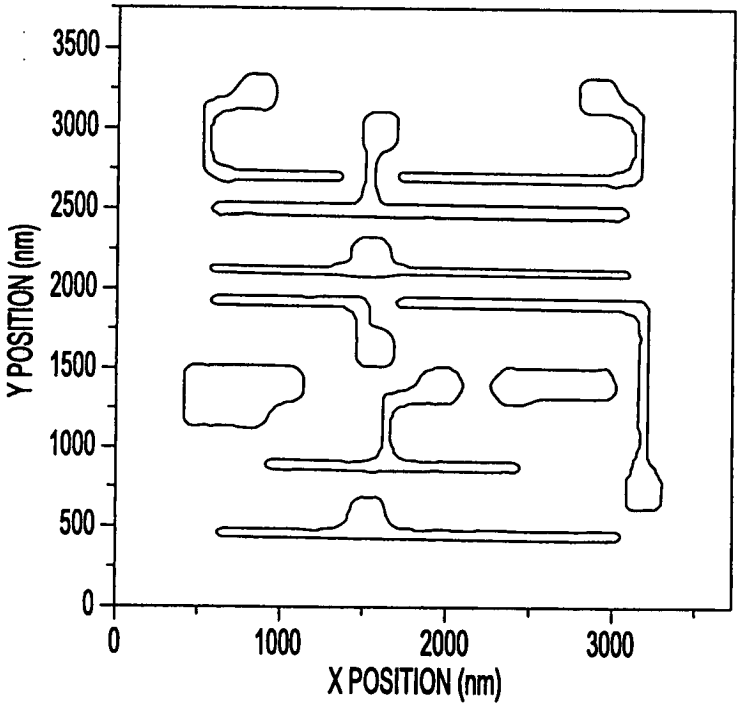
3500
3000
2500
2000
1500
1000
500
0
Y POSITION (nm)
0
1000
2000
3000
X POSITION (nm)

FIG. 5a

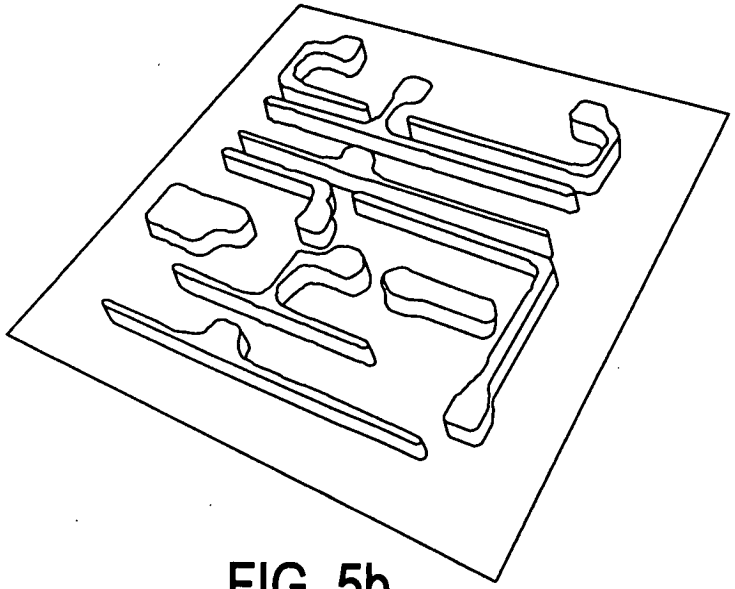

FIG. 5b

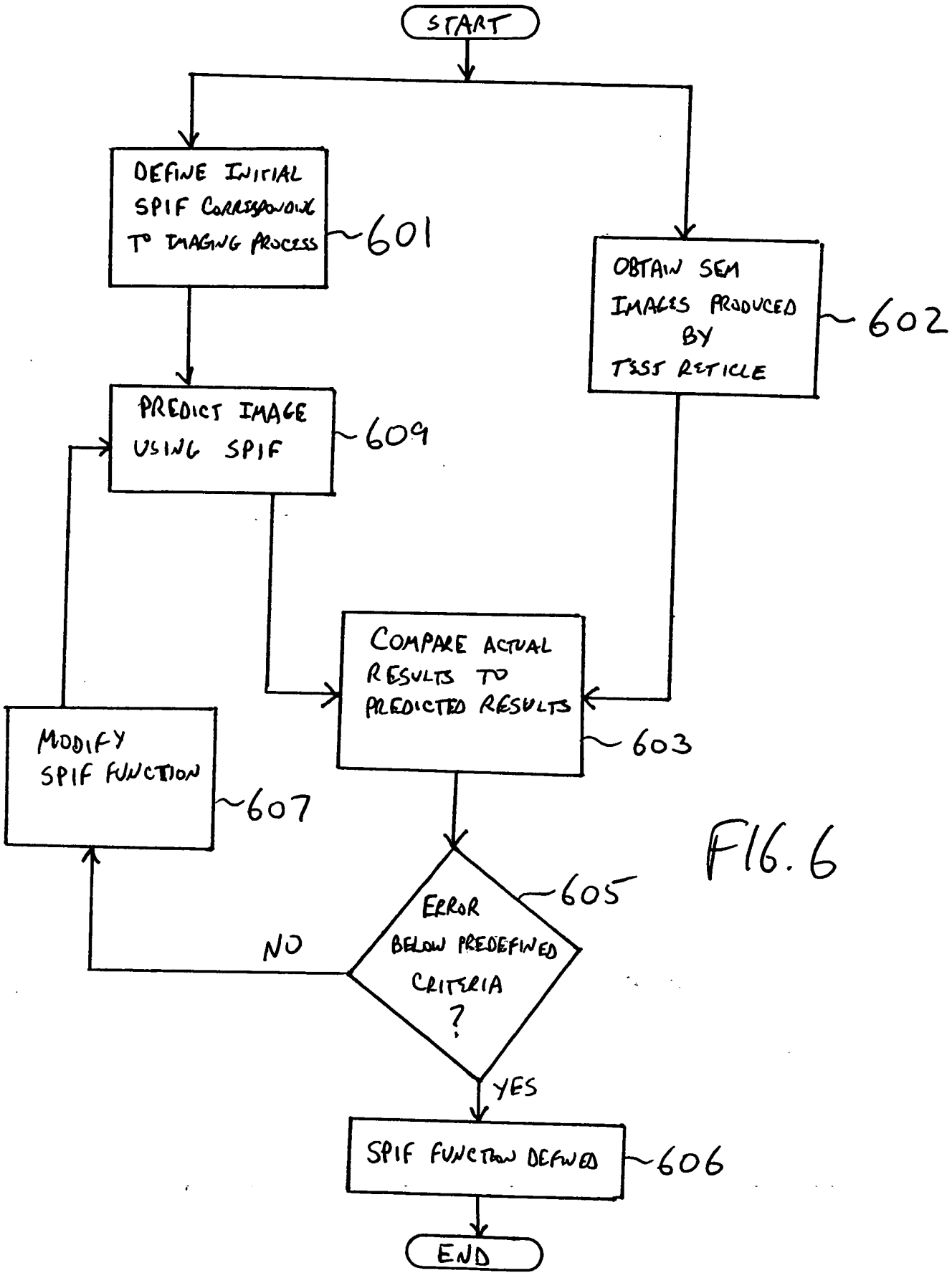
START
DEFINE INITIAL SPIF CORRESPONDING TO IMAGING PROCESS
601
OBTAIN SEM IMAGES PRODUCED BY TEST RETICLE
602
PREDICT IMAGE USING SPIF
609
COMPARE ACTUAL RESULTS TO PREDICTED RESULTS
603
MODIFY SPIF FUNCTION
607
ERROR BELOW PREDEFINED CRITERIA ?
605
NO
YES
SPIF FUNCTION DEFINED
606
END

FIG. 6

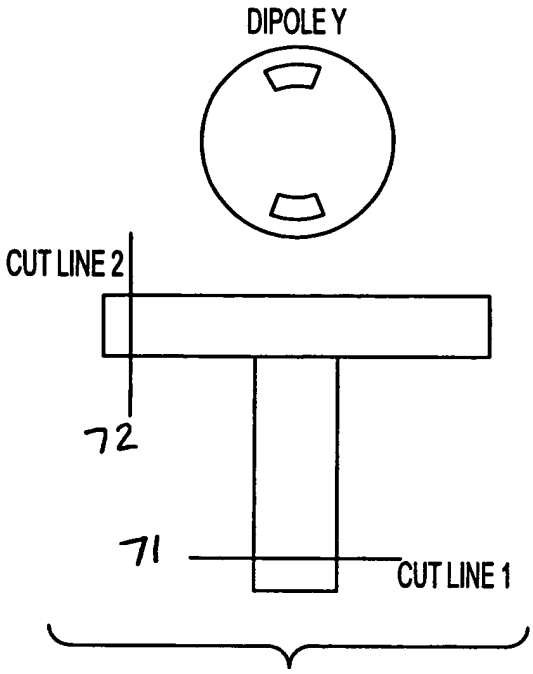

FIG. 7a

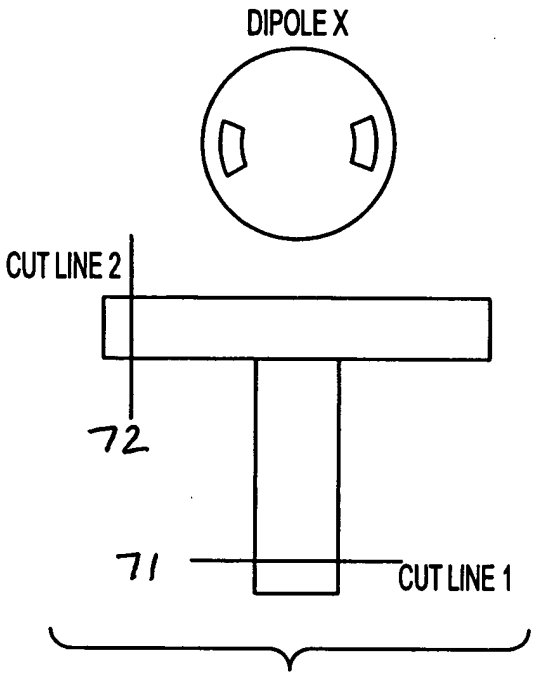

FIG. 7b

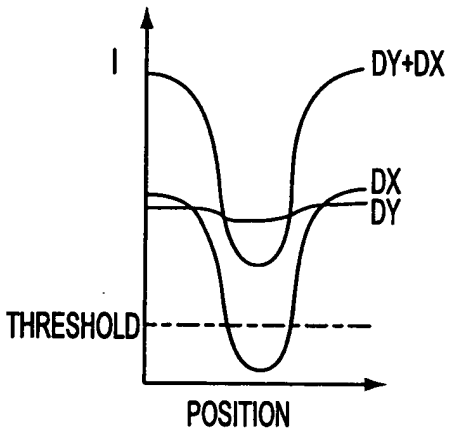

FIG. 8a

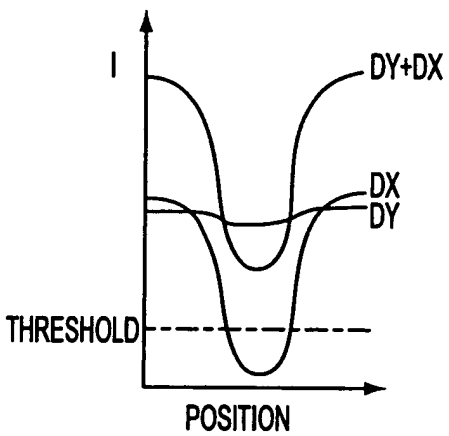

FIG. 8b

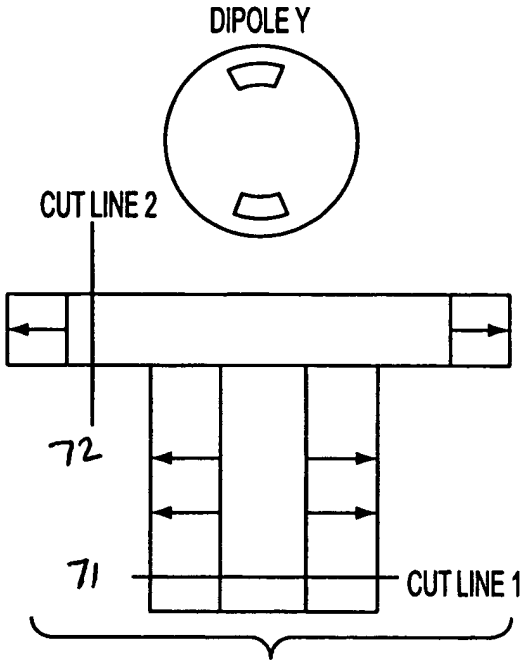

FIG. 9a

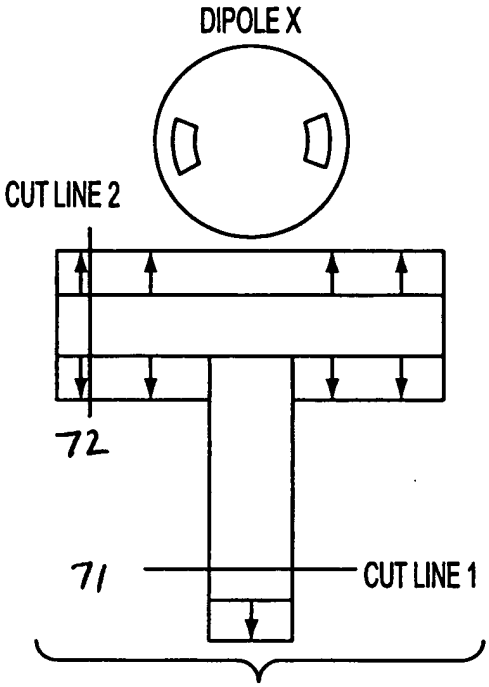

FIG. 9b

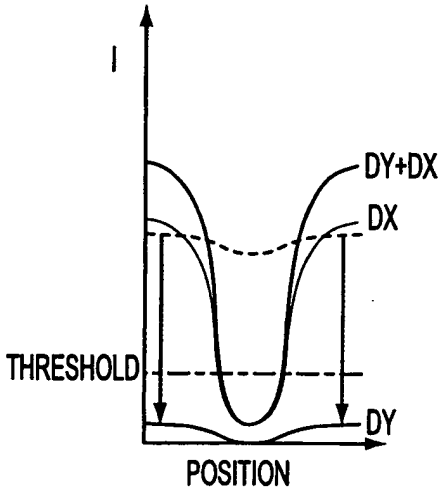

FIG. 10a

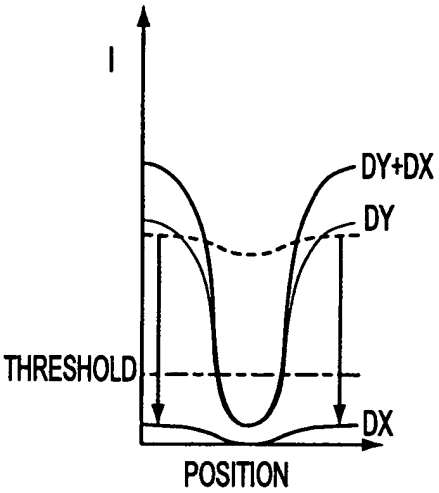

FIG. 10b

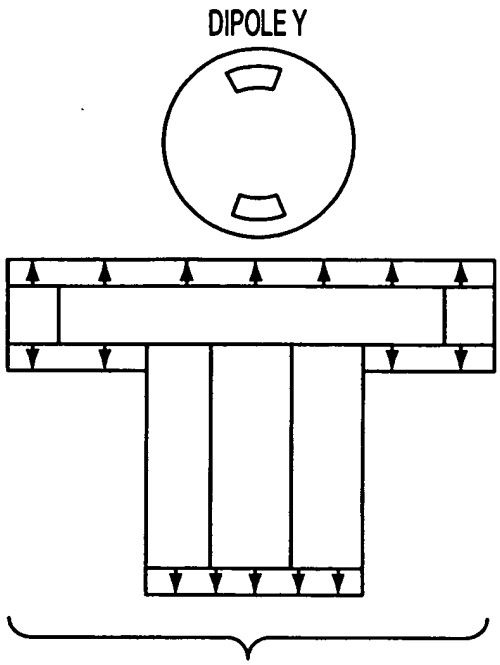

FIG. 11a

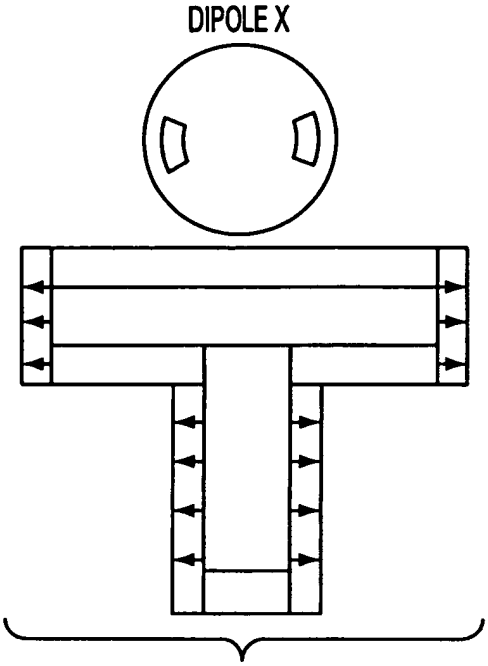

FIG. 11b

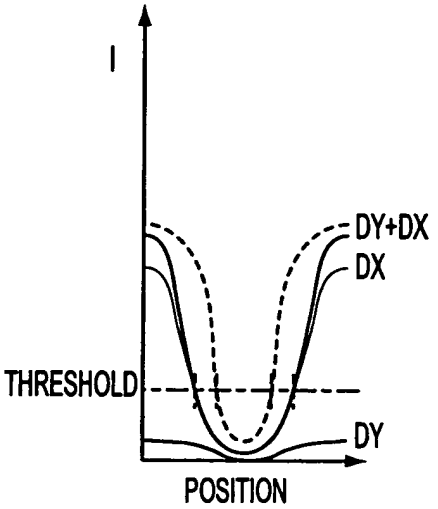

FIG. 12a

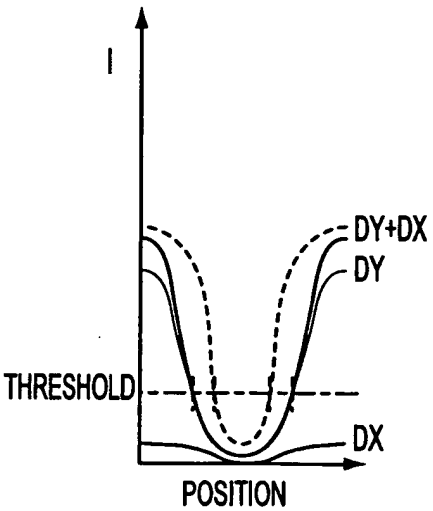

FIG. 12b

LAYOUT CONVERSION & OPC METHOD	RULE-BASED (EXISTING)	FULL MODEL METHOD
TREATMENT STEPS	4 TREATMENTS	3 TREATMENTS
JOG	SENSITIVE TO JOG	NOT SENSITIVE TO JOG
2D CORNER	NEGATIVE SERIF (WD/DP)	N/A
GATE SHRINK	READY	READY
DEVICE TYPE	MEMORY AND LOGIC NEED TO BE TREATED IN TWO PASSES	MEMORY AND LOGIC CAN BE HANDLE IN ONE PASS

FIG. 13

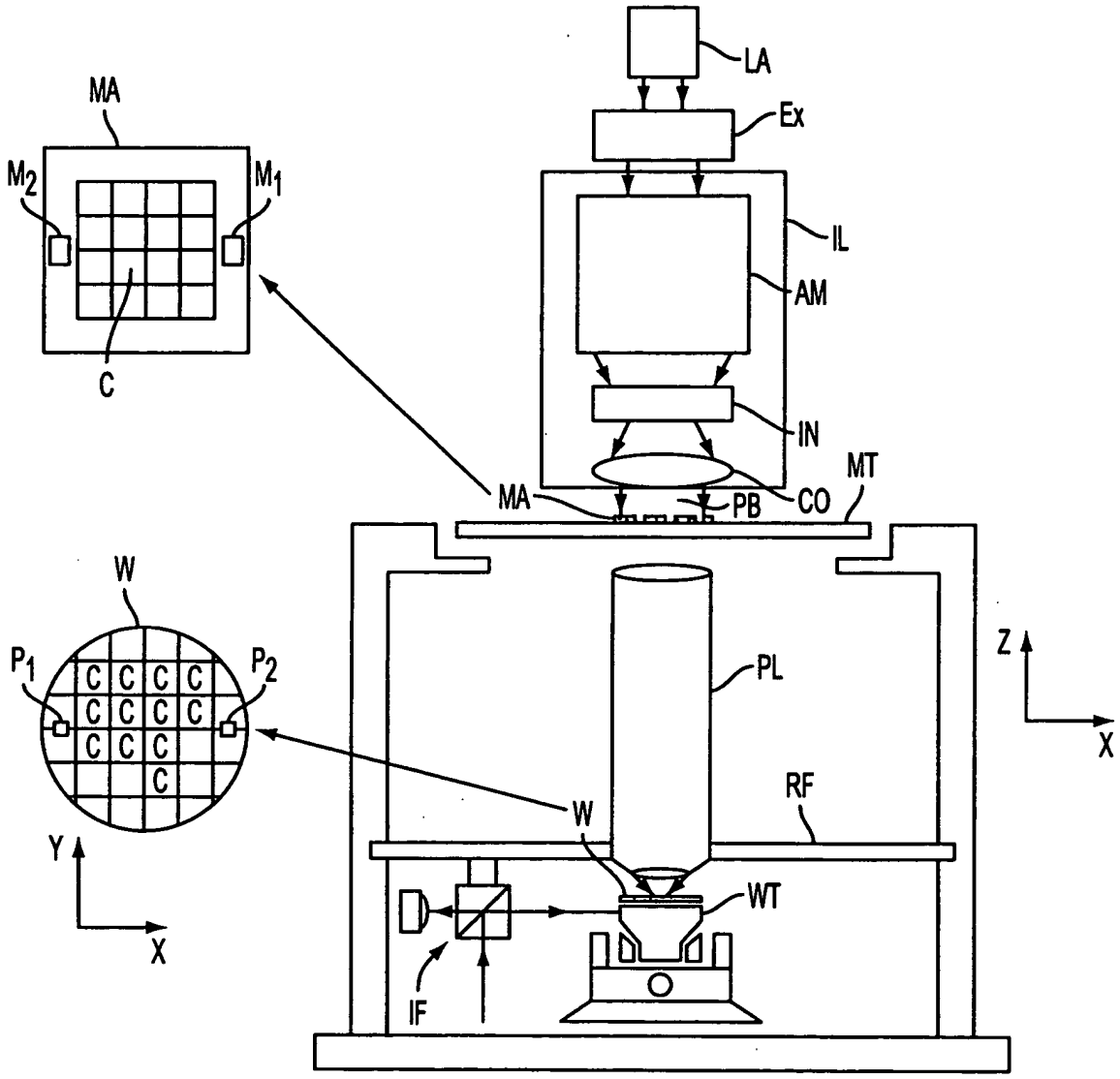

FIG. 14